EU-MATHS-IN
Success story

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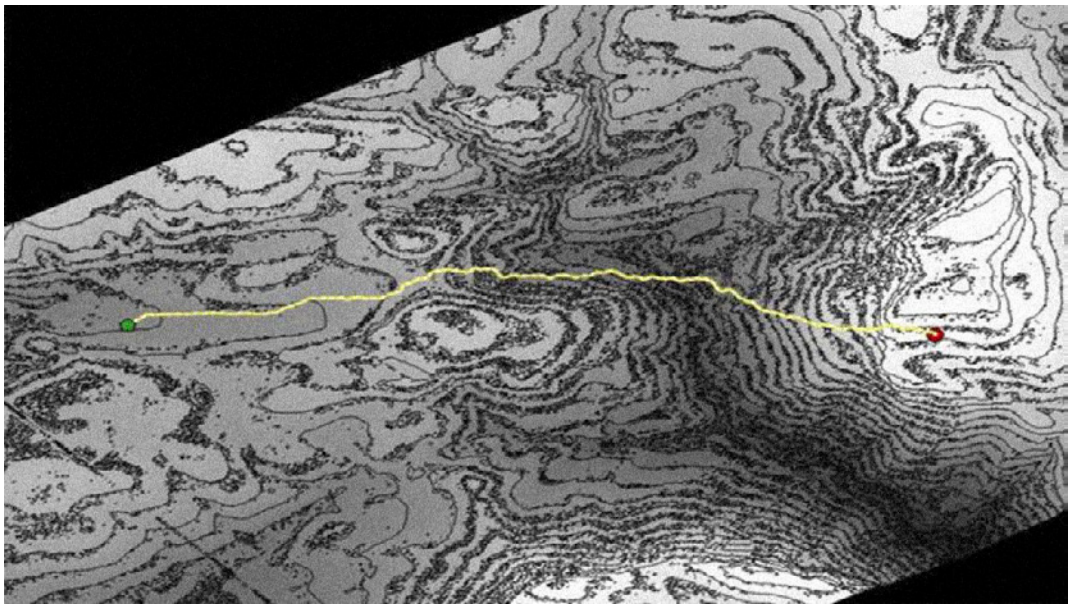
SS_015_2019

ENJAMBRE

Critical emergency missions with manned and unmanned aerial vehicles in cooperative flights.



Lower cost route between the position of the brigade (red dot) and the position of the camp or safe area (green dot).

PROBLEM DESCRIPTION

Development of intelligent systems to provide an advanced route control, allowing cooperative operations between manned aircrafts and RPA (observational operations), helping to characterize the territory and making the unload operations during fights against forest fires more efficient.

CHALLENGES AND GOALS

- ✔ Elaboration of several expert systems for decision making, based on different kinds of information stored in large databases.
- ✔ Algorithms for temperature data treatment and calculation of escape routes for the fire fighting squads will be developed.

MATHEMATICAL AND COMPUTATIONAL METHODS

- ✔ Statistical modelling.
- ✔ Mathematical Optimization.
- ✔ Analysis and programming of mathematical algorithms.
- ✔ R and Python programming.
- ✔ Databases (especially postGis).
- ✔ GIS systems (QGIS and PyQGIS, in particular).

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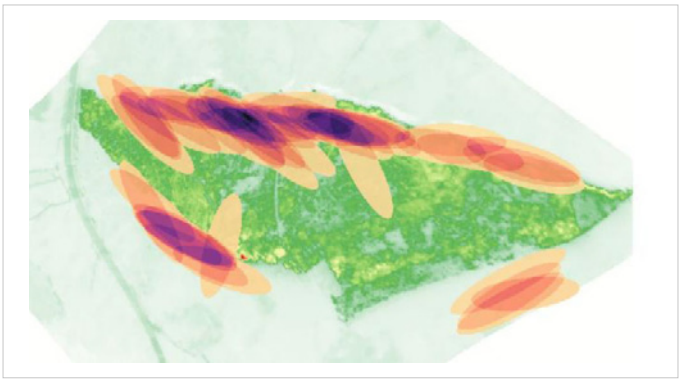

Watermark of the discharges made by five aircfraft that participat ed in the extinction of a fire that occurred in Galicia in the summer of 2017.

RESULTS AND BENEFITS

The results of this project will strongly contribute to develop technologies to optimize the efforts dedicated to fire extinction and that allow to reduce the affected surface, as well as increase the security of the brigades, improve the coordination in the extinction operations, extend the time zone of action and introduce new aerial resources in the fight against major forest fires.

Likewise, the investment, operation and maintenance costs of the operations can be reduced, increasing the coverage and efficiency of the service.

Databases to feed intelligent systems have been generated and their performance has been validated.

The company has highly precise information allowing to characterize the territory and feed the expert system linked to information from the National Forest Inventory (IFN3).

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